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Atty. Docket No. A-2-2

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Date of Deposit June 16, 1998

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

By: [signature]

BOX PATENT APPLICATION
ASSISTANT COMMISSIONER FOR PATENTS
Washington, D. C. 20231

06/16/98 U.S. PTO

Sir:

Transmitted herewith for filing under 37 CFR §1.53(b) is the
[ ] patent application, [ ] continuation patent application,
[X] divisional patent application, or [ ] continuation-in-part patent application of

Inventor(s)/Applicant Identifier: **PHILIP E. EGGERS and HIRA V. THAPLIYAL**

For: **SYSTEMS AND METHODS FOR ELECTROSURGICAL TISSUE TREATMENT IN CONDUCTIVE FLUID**

[X] This application claims priority from each of the following Application Nos./filing dates: 08/795,686 /February 5, 1997; 08/561,958/ November 22, 1995; 08/485,219/ June 7, 1995; 08/059,681 / May 10, 1993; 07/958,977 / October 9, 1992; 07/817,575 / January 7, 1992 the disclosure(s) of which is (are) incorporated by reference.

[X] Please amend this application by adding the following before the first sentence: --This application is a [ ] continuation [X] division of and claims the benefit of U.S. Application No. 08/795,686, filed February 5, 1997 the disclosure of which is incorporated by reference.--

Enclosed are:
- [X] 17 sheet(s) of [ ] formal [X] informal drawing(s); specification including description, claims and abstract; [X] title page.
- [X] A copy of the assignment of the invention to ArthroCare Corporation .
- [X] A copy of the [X] signed [ ] unsigned Declaration.
- [X] A copy of the Power of Attorney by Assignee.
- [X] A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27 [ ] is enclosed [X] was filed in the prior application **but is no longer proper.**
- [ ] A certified copy of a ______ application.
- [X] Information Disclosure Statement under 37 CFR 1.97.
- [X] Preliminary Amendment
- [X] Notification of change of [ ] power of attorney [X] correspondence address filed in prior application.
- [X] Please cancel claim(s) 1-79.

Handwritten in right margin: Spec and 17 sheets of drawing(s) rec'd. Specification under rule 53 ... drawing(s)

FOR:	NO. FILED (Col. 1)	NO. EXTRA (Col. 2)	SMALL ENTITY RATE	SMALL ENTITY FEE		OTHER THAN A SMALL ENTITY RATE	OTHER THAN A SMALL ENTITY FEE
BASIC FEE				$395	OR		$790
TOTAL CLAIMS	58 -20=	* 38	x11=	$	OR	x22=	$836
INDEP CLAIMS	3 -3=	* 0	x41=	$	OR	x82=	$
[ ] MULTIPLE DEPENDENT CLAIM PRESENTED			+130=	$	OR	+260=	$
			TOTAL	$	OR	TOTAL	$1626

* If the difference in Col. 1 is less than zero, enter "0" in Col. 2

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- [ ] The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).

[ ] A check for $______ is enclosed.
1 extra copies of this sheet are enclosed.

ph: (408) 736-0224

Respectfully submitted,
ARTHROCARE CORPORATION

[signature]

John T. Raffle, Reg. No.: 38,585

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on June 16, 1998

By Katie Zachman

Attorney Docket No. A-2-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	
PHILIP E. EGGERS et al.	Examiner: *unassigned*
Application No.: *unassigned*	Art Unit: *unassigned*
Filed: *herewith*	**PRELIMINARY AMENDMENT**
For: SYSTEMS AND METHODS FOR ELECTROSURGICAL TISSUE TREATMENT IN CONDUCTIVE FLUID (as amended)	

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Before substantive examination, please amend the above-identified application as follows.

IN THE SPECIFICATION:

On page 1, please delete the title and insert -SYSTEMS AND METHODS FOR ELECTROSURGICAL TISSUE TREATMENT IN CONDUCTIVE FLUID--.

On page 17, line 38, after "preferably", please insert the following text: --to within 5°C) before the onset of the next energy (current) pulse.

In addition to the above described methods, the applicant has discovered another mechanism for ablating tissue while minimizing the depth of necrosis. This mechanism involves applying a high frequency voltage between the active electrode surface and the return electrode to develop high electric field intensities in the vicinity of the target tissue site. The high electric field intensities lead to electric field induced molecular breakdown of target tissue through molecular dissociation (rather than thermal evaporation or carbonization). In other words, the tissue structure is volumetrically removed through molecular disintegration of complex organic molecules into non-viable hydrocarbons and nitrogen compounds. This molecular disintegration completely removes the tissue structure, as opposed to transforming the tissue material from a solid form directly to a vapor form, as is typically the case with ablation.

The high electric field intensities may be generated by applying a high frequency voltage that is sufficient to vaporize the electrically conducting liquid over at least a portion of the active electrode(s) in the region between the distal tip of the active electrode and the target tissue. Since the vapor layer or vaporized region has a relatively high electrical impedance, it increases the voltages differential between the active electrode tip and the tissue and causes ionization within the vapor layer due to the presence of an ionizable species (e.g., sodium when isotonic saline is the electrically conducting fluid). This ionization, under optimal conditions, induces the discharge of energetic electrons and photons from vapor layer and to the surface of the target tissue. This energy may be in the form of energetic photons (e.g., ultraviolet radiation), energetic particles (e.g., electrons) or a combination thereof.--

On page 20, line 38, after "fields are on the order of the", please insert the following text: --external field. Spatial extent of this region should be larger than the distance required for an electron avalanche to become critical and for an ionization front to develop. This ionization front develops and

propagates across the vapor layer via a sequence of processes occurring the region ahead of the front, viz, heat by electron injection, lowering of the local liquid density below the critical value and avalanche growth of the charged particle concentration.

Electrons accelerated in the electric field within the vapor layer will apparently become trapped after one or a few scatterings. These injected electrons serve to create or sustain a low density region with a large mean free path to enable subsequently injected electrons to cause impact ionization within these regions of low density. The energy evolved at each recombination is on the order of half of the energy band gap (i.e., 4 to 5 eV). It appears that this energy can be transferred to another electron to generate a highly energetic electron. This second, highly energetic electron may have sufficient energy to bombard a molecule to break its bonds, i.e., dissociate the molecule into free radicals.

The electrically conducting liquid should have a threshold conductivity in order to suitably ionize the vapor layer for the inducement of energetic electrons and photons. The electrical conductivity of the fluid (in units of milliSiemans per centimeter or mS/cm) will usually be greater than 0.2 mS/cm, preferably will be greater than 2 mS/cm and more preferably greater than 10 mS/cm. In an exemplary embodiment, the electrically conductive fluid is isotonic saline, which has a conductivity of about 17 mS/cm. The electrical conductivity of the channel trailing the ionization front should be sufficiently high to maintain the energy flow required to heat the liquid at the ionization front and maintain its density below the critical level. In addition, when the electrical conductivity of the liquid is sufficiently high, ionic pre-breakdown current levels (i.e., current levels prior to the initiation of ionization within the vapor layer) are sufficient to also promote the initial growth of bubbles--.

At the end of page 30, line 39, insert the following text:

--Return electrode 56 is preferably formed from an electrically conductive material, usually metal, which is selected from the group consisting of stainless steel alloys, platinum or its alloys, titanium or its alloys, molybdenum or its alloys, and nickel or its alloys. The return electrode 56 may be composed of the same metal or alloy which forms the electrode terminals 58 to minimize any potential for corrosion or the generation of electrochemical potentials due to the presence of dissimilar metals contained within an electrically conductive fluid 50, such as isotonic saline (discussed in greater detail below).

As shown in Fig. 2A, return electrode 56 is not directly connected to electrode terminals 58. To complete this current path so that terminals 58 are electrically connected to return electrode 56 via target tissue 52, electrically conducting liquid 50 (e.g., isotonic saline) is caused to flow along liquid paths 83. A liquid path 83 is formed by annular gap 54 between outer return electrode 56 and tubular support member 78. An additional liquid path 83 may be formed between an inner lumen 57 within an inner tubular member 59. However, it is generally preferred to form the liquid path 83 near the perimeter of the probe so that the electrically conducting liquid tends to flow radially inward towards the target site 88 (this preferred embodiment is illustrated in Figs. 8-19). In the embodiment shown in Figs. 2-5, the liquid flowing through inner lumen 57 may tend to splash radially outward, drawing electrical current therewith and potentially causing damage to the surrounding tissue.

The electrically conducting liquid 50 flowing through fluid paths 83 provides a pathway for electrical current flow between target tissue 52 and return electrode 56, as illustrated by the current flux lines 60 in Fig. 2A. When a voltage difference is applied between electrode array 12 and return electrode 56, high electric field intensities will be generated

at the distal tips of terminals 58 with current flow from array 12 through the target tissue to the return electrode, the high electric field intensities causing ablation of tissue 52 in zone 88.–

IN THE CLAIMS:

Please delete claims 1-79 and add the following new claims:

--80. (New) A method for applying electrical energy to a target site on a structure on or within a patient's body, the method comprising:

positioning an electrode terminal into at least close proximity with the target site in the presence of an electrically conducting fluid;

positioning a return electrode within the electrically conducting fluid to generate a current flow path between the electrode terminal and the return electrode; and

applying a high frequency voltage difference between the electrode terminal and the return electrode such that an electrical current flows from the electrode terminal, through the region of the target site, and to the return electrode through the current flow path.

81. (New) The method of claim 80 wherein the electric current flows substantially through the electrically conducting fluid while minimizing electric current flow passing through the body structure.

82. (New) The method of claim 80 wherein at least a portion of the electric current passes through the body structure.

83. (New) The method of claim 80 further comprising immersing the target site within a volume of the electrically conductive fluid and positioning the return electrode within the volume of electrically conductive fluid to generate the current flow path between the target site and the return electrode.

84. (New) The method of claim 80 further comprising delivering the electrically conductive fluid to the target site.

85. (New) The method of claim 80 wherein the electrode terminal comprises a single active electrode disposed near the distal end of an instrument shaft.

86. (New) The method of claim 80 wherein the electrode terminal includes an array of electrically isolated electrode terminals disposed near the distal end of an instrument shaft.

87. (New) The method of claim 80 wherein the electrically conductive fluid comprises isotonic saline.

88. (New) The method of claim 80 including independently controlling current flow to the electrode terminal based on electrical impedance between the electrode terminal and the return electrode.

89. (New) The method of claim 80 wherein the return electrode is spaced from the electrode terminal such that when the electrode terminal is brought adjacent a tissue structure immersed in electrically conductive fluid, the return electrode is spaced from the tissue structure and the electrically conductive fluid completes a conduction path between the electrode terminal and the return electrode.

90. (New) The method of claim 80, wherein the return electrode is located on the probe, further comprising an insulating matrix at the distal tip of the probe between the return electrode and the electrode terminal, the insulating matrix comprising an inorganic material.

91. (New) The method of claim 90 wherein the inorganic material is selected from the group consisting essentially of

ceramic, glass and glass/ceramic compositions.

92. (New) The method of claim 90 further comprising applying a sufficient voltage difference between the return electrode and the electrode terminal to effect the electrical breakdown of tissue in the immediate vicinity of the electrode terminal.

93. (New) The method of claim 80 further comprising measuring the temperature at the target site and limiting power delivery to the electrode terminal if the measured temperature exceeds a threshold value.

94. (New) The method of claim 80 further comprising applying a sufficient high frequency voltage difference to vaporize the electrically conductive fluid in a thin layer over at least a portion of the electrode terminal and to induce the discharge of energy to the target site in contact with the vapor layer.

95. (New) The method of claim 94 wherein at least a portion of the energy induced is in the form of photons having a wavelength in the ultraviolet spectrum.

96. (New) The method of claim 94 wherein at least a portion of the energy is in the form of energetic electrons.

97. (New) The method of claim 80 wherein the voltage is in the range from 500 to 1400 volts peak to peak.

98. (New) The method of claim 80 further comprising generating a voltage gradient between the electrode terminal and tissue at the target site, the voltage gradient being sufficient to create an electric field that causes the breakdown of tissue through molecular dissociation or disintegration.

99. (New) The method of claim 84 wherein the electrode terminal is located on the distal end of a probe, and wherein the delivering step comprises supplying the electrically conducting fluid to a proximal end of an axial lumen within the probe and directing the fluid through a distal end of the axial lumen to the electrode terminal

100. (New) The method of claim 84 further including positioning a distal end of a fluid supply shaft adjacent the electrode terminal, the delivering step comprising directing the electrically conducting fluid through an inner lumen in the fluid supply shaft that is electrically connected to the return electrode and discharging the fluid through an open distal end of the supply shaft towards the electrode terminal.

101. (New) The method of claim 99 wherein the return electrode is an inner tubular member defining an axial lumen electrically connected to the inner tubular member, the delivering step including directing electrically conducting fluid through the inner lumen to the distal end of the probe over the electrode terminal.

102. (New) The method of claim 99 wherein the return electrode is an outer tubular member defining an axial passage between the outer surface of the probe and the inner surface of the outer tubular member, the delivering step including directing the electrically conducting fluid through the inner lumen to the distal end of the probe over the electrode terminal.

103. (New) An electrosurgical probe for applying electrical energy to a tissue structure at a target site, the probe comprising:

a shaft having a proximal end and a distal end;

an electrode terminal having a tissue treatment portion disposed at or near the distal end of the shaft;

a return electrode coupled to the shaft and having an

exposed fluid contact surface;

at least one connector disposed near the proximal end of the shaft for electrically coupling the electrode terminal to a high frequency voltage source; and

wherein the return electrode is spaced from the electrode terminal such that when the tissue treatment portion of the electrode terminal is brought adjacent a tissue structure immersed in electrically conductive fluid, the tissue treatment portion of the electrode terminal is positioned between the fluid contact surface of the return electrode and the tissue structure and the electrically conductive fluid completes a conduction path between the electrode terminal and the return electrode.

104. (New) The probe of claim 103 wherein the return electrode is spaced about 0.5 to 25 mm from the electrode terminal in a direction away from the tissue structure when the electrode terminal is brought adjacent a tissue structure.

105. (New) The probe of claim 103 wherein the return electrode is positioned on the shaft proximal to the electrode terminal.

106. (New) The probe of claim 103 further comprising a power limiting element coupled to the electrode terminal for limiting power to the electrode terminal based on the electrical impedance between the electrode terminal and the return electrode.

107. (New) The probe of claim 103 wherein the electrode terminal extends a distance of about 0.05 to about 1.0 mm from the shaft.

108. (New) The probe of claim 103, further comprising a temperature sensor located adjacent the electrode terminal wherein the connector also electrically couples the temperature sensor to the high frequency voltage source.

109. (New) The probe of claim 103 wherein the electrode terminal extends away from the shaft by a distance in the range from 0.00 mm to 3.0 mm.

110. (New) The probe of claim 103 further comprising an electrode array disposed at the distal end of the shaft, the electrode array comprising a plurality of electrode terminals.

111. (New) The probe of claim 103, further comprising an insulating support positioned near the distal end of the probe between the return electrode and the electrode terminal and comprising an inorganic matrix material.

112. (New) The probe of claim 106 wherein the inorganic matrix material is selected from the group consisting essentially of glass, ceramic and glass/ceramic.

113. (New) The probe of claim 105 wherein the electrode array includes at least three electrically isolated terminals having substantially the same applied potential.

114. (New) The probe of claim 103 further comprising a single active electrode terminal, wherein the single active electrode terminal and the return electrode are configured to effect the electrical breakdown of tissue in the immediate vicinity of the electrode terminal when high frequency voltage is applied between the electrode terminal and the return electrode in the presence of electrically conducting fluid.

115. (New) The probe of claim 103 wherein current or voltage is limited to the electrode terminal based on impedance between the electrode terminal and the return electrode.

116. (New) The probe of claim 103 further comprising an active current limiting element coupled to the electrode

terminal and comprising an impedance sensor adapted for coupling to a high frequency voltage source.

117. (New) The probe of claim 116 wherein the impedance sensor comprises means for measuring current flow for a given applied voltage.

118. (New) The probe of claim 116 wherein the impedance sensor comprises a resonant series output circuit having a resonant frequency that changes with the capacitance of the load.

119. (New) The probe of claim 116 further comprising a passive current limiting element for limiting or interrupting current flow to the electrode terminal based on the impedance between the electrode terminal and the return electrode.

120. (New) The probe of claim 119 wherein the passive current limiting element is selected from the group consisting essentially of inductors, capacitors, resistors and combinations thereof.

121. (New) The probe of claim ? wherein the return electrode and the electrode terminal are positioned relative to each other such that the conduction path passes through the tissue structure at the target site.

122. (New) The probe of claim ? wherein the return electrode and the electrode terminal are positioned relative to each other such that the conduction path passes directly from the electrode terminal through the electrically conductive fluid to the return electrode.

123. (New) The probe of claim ? wherein the return electrode is spaced from the electrode terminal, and the return electrode and electrode terminal are configured such that, when

the tissue treatment portion of the electrode terminal is brought adjacent a tissue structure in contact with electrically conductive fluid, and high frequency electrical energy is applied to the electrode terminal, the high frequency electrical energy is sufficient to effect the molecular breakdown of the tissue structure and to convert solid tissue cells at the target site directly into gaseous products of ablation.

124. (New) The probe of claim 123 wherein the gaseous products of ablation comprise non-condensable gases.

125. (New) The probe of claim ? wherein the high frequency electrical energy is sufficient to vaporize at least a portion of the electrically conducting fluid at the target site.

126. (New) An electrosurgical system for applying electrical energy to a tissue structure at a target site, the system comprising:

a shaft having a proximal end and a distal end;

an electrode terminal disposed at or near the distal end of the shaft;

at least one connector disposed near the proximal end of the shaft for electrically coupling the electrode terminal to a high frequency voltage source; and

means for applying high frequency voltage to the electrode terminal and a return electrode in the presence of electrically conducting fluid such that an electrical current flows from the electrode terminal, and through the target site, to the return electrode through a current flow path in the electrically conducting fluid.

127. (New) The system of claim 126 wherein said applying means comprises a power supply, and a return electrode on the shaft spaced from the electrode terminal.

128. (New) The system of claim 126 wherein the

electrode terminal comprises tungsten, and further comprising a ceramic insulating member between the electrode terminal and the return electrode.

129. (New) The system of claim 126 wherein the return electrode has a larger exposed surface area than the electrode terminal.

130. (New) The system of claim 126 wherein the return electrode is axially spaced about 0.5 to about 5 mm from the electrode terminal.

131. (New) The system of claim 127 wherein the power supply applies a high frequency voltage difference in the range of about 500 to 900 volts peak-to-peak.

132. (New) The system of claim 126 wherein the electrode terminal has a contact area less than about 5 mm^2

133. (New) The system of claim 126, wherein the electrode terminal extends away from the shaft by a distance in the range from 0.00 mm to 3.0 mm.

134. (New) The system of claim 126 further comprising an electrode array disposed at the distal end of the shaft, the electrode array comprising a plurality of electrode terminals.

135. (New) The system of claim 126, further comprising an insulating support positioned near the distal end of the probe between the return electrode and the electrode terminal and comprising an inorganic matrix material, and wherein the inorganic matrix material is selected from the group consisting essentially of glass, ceramic and glass/ceramic.

136. (New) The system of claim 126 further comprising a single active electrode terminal, wherein the single active

electrode terminal and the return electrode are configured to effect the electrical breakdown of tissue in the immediate vicinity of the electrode terminal when high frequency voltage is applied between the electrode terminal and the return electrode in the presence of electrically conducting fluid.

137. (New) The system of claim 126 wherein current or voltage is limited to the electrode terminal based on impedance between the electrode terminal and a return electrode spaced therefrom.--

REMARKS

Amendment to the Specification

Applicants have amended the specification to include inadvertently omitted pages 18, 21 and 31 from the parent application. These two pages were originally filed in Application No. 08/561,958, filed November 22, 1995, from which the present application claims priority. No new substantive matter has been entered.

CONCLUSION

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (415) 326-2400.

Respectfully submitted,

John T. Raffle
Reg. No. 38,585

ArthroCare Corporation
595 N. Pastoria Avenue
Sunnyvale, California 94086-2916
(408) 736-0224

COPY

Attorney Docket No. 16238-000700

DECLARATION

As a below named inventor, I declare that:

My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SYSTEM AND METHOD FOR ELECTROSURGICAL CUTTING AND ABLATION,

the specification of which __ is attached hereto or X was filed on November 22, 1995 as Application No. 08/561,958 ________ and was amended on __________ (if applicable).

I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56. I claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign applications(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Country	Application No.	Date of Filing	Priority Claimed Under 35 USC 119
	PCT/US94/05168	May 10, 1994	Yes X No __

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date
n/a	

I claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Application No.	Date of Filing	Status
08/485,219	June 7, 1995	__ Patented x Pending __ Abandoned
08/059,681	May 10, 1993	__ Patented __ Pending x Abandoned
07/958,977 (now 5,366,443)	October 9, 1992	x Patented __ Pending __ Abandoned
07/817,575	January 7, 1992	__ Patented __ Pending x Abandoned

Send Correspondence to:	Direct Telephone Calls to:
John T. Raffle TOWNSEND and TOWNSEND and CREW Steuart Street Tower One Market Plaza, 20th Floor San Francisco, CA 94105	(Name, Reg. No., Telephone No.) Name: John T. Raffle Reg. No. 38,585 Telephone: (415) 326-2400

Full Name of Inventor 1	Last Name EGGERS	First Name PHILIP	Middle Name or Initial E.	
Residence & Citizenship	City Dublin	State/Foreign Country Ohio	Country of Citizenship U.S.A.	
Post Office Address	Post Office Address 5366 Reserve Drive	City Dublin	State/Country Ohio	Zip Code 43017
Full Name of Inventor 1	Last Name THAPLIYAL	First Name HIRA	Middle Name or Initial V.	
Residence & Citizenship	City Los Altos	State/Foreign Country California	Country of Citizenship U.S.A.	
Post Office Address	Post Office Address 1192 Volti Lane	City Los Altos	State/Country California	Zip Code 94024

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature of Inventor 1 Philip E. Eggers	Signature of Inventor 2 Hira V. Thapliyal
Date: April 26, 1996	Date: Apr. 25, 1996

I:\U0235\-7dec.pas

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) & 1.27(c)) - SMALL BUSINESS CONCERN

Applicant or Patentee: Phillip E. Eggers and Hira V Thapliyal
Application or Patent No.: 08/561,958
Filed or Issued: November 22, 1995
Title: SYSTEM AND METHOD FOR ELECTROSURGICAL CUTTING AND ABLATION

COPY

I hereby declare that I am

[ ] the owner of the small business concern identified below:
[x] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF SMALL BUSINESS CONCERN Arthrocare Corporation
ADDRESS OF SMALL BUSINESS CONCERN 5366 Reserve Drive, Dublin, Ohio, 43017

I hereby declare that the above-identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled SYSTEM AND METHOD FOR ELECTROSURGICAL CUTTING AND ABLATION by inventor(s) Philip E. Eggers and Hira V Thapliyal described in

[ ] the specification filed herewith
[X] Application No. 08/561,958 , filed November 22, 1995
[ ] Patent No. ______ , issued ______

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights in the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern that would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME
ADDRESS

[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

NAME
ADDRESS

[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Hira V Thapliyal
TITLE OF PERSON IF OTHER THAN OWNER President and CEO
ADDRESS OF PERSON SIGNING 1192 Volti Lane, Los Altos, California, 94024

SIGNATURE [signature] DATE Apr. 25, 1996

United States Patent & Trademark Office

Office of Initial Patent Examination – Scanning Division

Application deficiencies found during scanning:

1. Application papers are not suitable for scanning and are not in compliance with 37 CFR 1.52 because:
   - ☐ All sheets must be the same size and either A4 (21 cm x 29.7 cm) or 8-1/2" x 11" Pages ______________ do not meet these requirements.
   - ☐ Papers are not flexible, strong, smooth, non-shiny, durable, and white.
   - ☐ Papers are not typewritten or mechanically printed in permanent ink on one side.
   - ☐ Papers contain improper margins. Each sheet must have a left margin of at least 2.5 cm (1") and top, bottom and right margins of at least 2.0 cm (3/4").
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2. Drawings are not in compliance and were not scanned because:
   - ☐ The drawings or copy of drawings are not suitable for electronic reproduction.
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   - ☐ Each sheet must include a top and left margin of at least 2.5 cm (1"), a right margin of at least 1.5 cm (9/16") and a bottom margin of at least 1.0 cm (3/8").

3. Page(s) ______________ are not of sufficient clarity, contrast and quality for electronic reproduction.

4. Page(s) ______________ are missing.

5. OTHER: All drawings included